

Santa Cruz River Civic-Science Conservation Initiative
EPA Targeted Watersheds Grant Full-Project Work Plan
Sonoran Institute – Submitted: December 2007

Project Abstract and Goals

The Santa Cruz River is a visible green ribbon of life that connects the U.S. and Mexico, bridges rural and urban landscapes, and joins together diverse stakeholders. As one of the most endangered forest types in the United States, riparian ecosystems are ecologically critical to watershed health. In an arid region where water is scarce however, the greatest challenge to conserving river systems comes from reconciling competing demands and engaging local communities in collaborative conservation actions. The Sonoran Institute is responding to this challenge through our Santa Cruz River Civic-Science Conservation Initiative. The project's **three integral components—restoration, monitoring, and policy**—will culminate in the creation of a coordinated and watershed-wide river conservation authority and a *State of the Santa Cruz River* report that outlines a holistic and integrated management framework for the watershed.

The objective of this project, *Conserving the Santa Cruz River: A Civic-Science Approach*, is to conserve and augment watershed functions and local water tables that support the river and riparian corridor through on-the-ground restoration and water harvesting projects. Building directly on information gained from these activities, we will develop a coordinated monitoring plan in the rural and urban areas of the watershed. Monitoring information and lessons learned regarding this watershed approach to restoring and conserving riparian conditions will be made available to local decision-makers to assist in implementing current policies and developing innovative new conservation management strategies. The Conservation Steering Committee will ensure that information gained and progress made from on-the-ground restoration and monitoring activities and innovative policies that are outlined in the *State of the Santa Cruz River* report will synergistically contribute to long-term, community-driven and collaborative, conservation of the watershed. These activities are critical to retaining the ecological and cultural values of the region and promoting long-lasting conservation.

Time Frame: Project start date: October 1, 2007
Project end date: December 30, 2010

Primary Organizational Partners

Arizona Department of Environmental Quality
Arizona Department of Water Resources
Arizona Open Land Trust
Arizona State Parks
City of Tucson
Friends of the Santa Cruz River
La Semilla
National Park Service
Santa Cruz County
Tucson Audubon Society
Tumacácori NHP
University of Arizona
University of Sonora

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Component 1 – Characterize Watershed and Monitor Ecological Functions

Activity 1: Riparian Assessment and Monitoring

Outcome: A holistic and basin-wide riparian ecosystem assessment and monitoring framework that tracks ecosystem changes at multiple sites and provides relevant and timely scientific information to managers and policy-makers.

Outputs:

➤ A Conservation Greenprint for the Santa Cruz River Watershed that compiles GIS layers from local jurisdictions and partners to establish spatially explicit ecologically rich priority conservation areas that will be specifically targeted for restoration and monitoring efforts in this project.	Year 1, 1 st – 3 rd Q
➤ A one-day workshop with watershed experts to identify key indicators and monitoring priorities for watershed health. The Conservation Greenprint will be used as a foundation for this workshop. If logistically feasible, a speaker from the Integration and Application Network (IAN) to discuss science integration and communication insights from their work on the Chesapeake Bay and in other watersheds.	Year 1, 2 nd Q
➤ An approved Arizona Department of Environmental Quality (ADEQ) water quality sampling analysis plan to guide our monitoring efforts and ensure that our data is included in the annual ADEQ 305b reports to Congress.	Year 1 2 nd & 3 rd Q
➤ A comprehensive bibliography on riparian monitoring protocols that will support Santa Cruz River site-specific protocol development and data analysis.	Year 1 1 st – 3 rd Q
➤ An ecosystem monitoring implementation plan detailing monitoring protocols and locations for the Santa Cruz River study area, including Sonora, Mexico.	Year 1 1 st – 3 rd Q
➤ Monitoring protocols for City of Tucson washes and associated riparian habitat will be developed to track ecological changes in urban riparian zones.	Year 1, 3 rd Q – Year 2, 3 rd Q
➤ An on-line database to house monitoring protocols, monitoring data, and additional ecological information collected throughout the Santa Cruz River watershed.	Year 1, 2 nd Q – Year 2, 3 rd Q
➤ An assessment of the impacts to washes located in the urban core and suburban fringe that will help determine the effects of urban development on riparian habitat quality, surface water quality, and watershed health.	Year 2
➤ An assessment and inventory of the potential to augment riparian habitat using “additional water” generated by run-off from roofs, parking lots, and streets adjacent to washes.	Years 2 & 3
➤ Integration of wash monitoring data into City of Tucson Greenway Plan development and implementation.	Years 2, 2 nd Q – Year 3 4 th Q
➤ Coordination with federal, state, and local agencies, as well as local NGO’s on monitoring protocols and data.	On-going

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Activity 2: Research, Create, and Distribute a Riparian Health Score Card

Outcome: A basin-wide, spatially explicit, and scientifically rigorous Riparian Health Score Card for residents, managers, agencies, stakeholder, and local politicians. This Score Card will broadly disseminate information on ecological conditions and inform watershed management and policy decisions.

Outputs:

➤ Formation of a Science Advisory Team that will guide the development of riparian monitoring protocols that will inform the Riparian Score Card.	Year 1 1 st – 3 rd Q
➤ An annual State of Santa Cruz River Science meeting to gather data and coordinate research activities. Begin this meeting series with the Watershed Workshop in Year 1, 2 nd Q.	Years 1, 2, & 3 2 nd Q
➤ A broad literature search on successful examples of “Score Cards” that will be used as a foundation for the development of this report.	Year 1 2 nd – 4 th Q
➤ A Riparian Health Score Card that communicates ecosystem monitoring results that can be widely distributed on a regular basis (every 1-2 yrs).	Years 2 & 3

Component 2 – Restoration to Enhance and Protect Watershed Functions

Activity 1: Restoration

Outcome: Restore and augment natural infiltration capacity in the Santa Cruz River watershed to enhance water table recharge, riparian habitat health, and healthy river function.

Outputs: Five restoration projects will feature projects that capture storm water runoff with the intent of augmenting infiltration, preventing erosion, managing stormwater flows, and preserving and enhancing riparian habitat. The monitoring plan developed in Component 1, Activity 1 will be implemented at each of these locations to track ecological improvements from the restoration projects as well ecological changes that may be occurring independently.

1. Esperanza Ranch, Santa Cruz County	
➤ Native riparian vegetation plantings and gabion construction will enhance and restore riparian vegetation within this 300 acre conservation easement.	Year 1 1 st – 3 rd Q
➤ Volunteer work days will offer local residents an opportunity to participate directly in riparian restoration and will enhance riparian stewardship.	Year 1 1 st – 3 rd Q
2. Three Canyons Residential Development, Santa Cruz County	
➤ Construction of 600 brush weirs in small washes and tributaries throughout the residential site.	Years 1, 2, 3
➤ 1,000 native trees and shrubs will be planted along washes and tributaries to enhance the structure and function of the riparian corridors.	Years 1, 2, 3
➤ Monitoring protocols that measure the effectiveness of brush weirs and erosion-control techniques in small washes throughout the site will be developed and implemented. Data gathered will reflect changes in riparian vegetation composition and density, avian populations, and short-term changes in channel geomorphology.	Years 1, 2, 3
3. San Lázaro, Sonora	
➤ Complete site assessment and identification of San Lázaro water harvesting and restoration sites.	Year 1 1 st – 3 rd Q
➤ Up to six gabions will be installed to control erosion along tributaries to the Santa Cruz River in San Lázaro.	Year 1, 4 th Q – Year 2, 3 rd Q
➤ Designated restoration sites will be re-seeded with native <i>Carex</i> shrubs to further control erosion.	Year 1, 4 th Q – Year 2, 3 rd Q

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4. Arizona State Parks		
➤ A collaboratively developed restoration plan for Sonoita Creek State Natural Area that identifies high priority restoration sites.	Year 1, 3 rd Q – Year 2, 1 st Q	
➤ In collaboration with Arizona State Parks, the restoration plan will be implemented and will include native vegetation plantings to stabilize eroded slopes.	Year 1, 3 rd Q – Year 2, 1 st Q	
5. Tumacácori NHP		
➤ A collaboratively developed restoration plan for riparian vegetation and eroded stream banks along the Santa Cruz River as it runs through Tumacácori NHP.	Year 1 3 rd & 4 th Q	
➤ In collaboration with Tumacácori NHP staff, the restoration plan will be implemented and will include native vegetation plantings.	Year 1 1 st & 2 nd Q	
➤ Participation in the annual Tumacácori Fiesta (first weekend in December) to widely disseminate results and activities for this project and to interact with local stakeholders.	Years 1, 2, 3 1 st Q	
6. City of Tucson		
➤ A collaboratively developed water harvesting project plan that will guide water harvesting workshops supported by this grant and will be integrated into City of Tucson water conservation efforts.	Year 1, 2 nd Q – Year 2, 1 st Q	
➤ A water harvesting effectiveness monitoring plan will be developed and implemented for selected City of Tucson water harvesting locations.	Year 1, 2 nd Q – Year 2, 1 st Q	

Activity 2: Water Harvesting Workshops and Effectiveness Monitoring

Outcome: Highlight successes from the restoration projects, promote water conservation, and reduce groundwater consumption in Santa Cruz River local water tables.

Outputs:

➤ A total of 8 community water harvesting workshops will be held at the restoration sites described above to demonstrate practical and cost-effective techniques to enhance riparian habitat, to off-set groundwater demand, and to increase infiltration in tributaries and washes. These workshops will be widely promoted and will be free and open to the public and will offer local residents and stakeholder's additional opportunities to participate in this project and increase their knowledge and stewardship of local water resources.	Years 1, 2, 3
➤ 3 water harvesting workshops will be held in urban residential areas in Tucson, Nogales, Arizona, and Nogales, Sonora to further disseminate information about riparian protection and water conservation.	Years 1, 2, 3
➤ 2 water harvesting workshops will be held on working ranches on both sides of the border to demonstrate landscape water harvesting principles.	Years 2 & 3
➤ Protocols that monitor the general effectiveness of water harvesting systems (i.e. additional vegetation supported, amount of precipitation, # of gallons collected in cisterns) and that will engage local homeowners with water harvesting systems in climate and ecological monitoring, will be implemented at each site.	Year 1, 2 nd & 4 th Q

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Activity 3: Small Grants Program

Outcome: Provide assistance to landowners wanting to develop a restoration and/or water harvesting plan for their land.

Outputs:

➤ A small grants program will be developed and implemented to assist willing landowners in the development of AZ Water Protection Fund grant applications and water harvesting site assessment plans.	Years 2 & 3
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Component 3 – Policy

Activity 1 – Implement Santa Cruz County River Conservation Taskforce Recommendations

Outcome: Support Santa Cruz River conservation policies that simultaneously benefit riparian habitat at the site-specific level and synthesize watershed-wide activities into coordinated conservation actions.

Outputs:

➤ A conservation finance strategy for Santa Cruz County that utilizes local revenue sources to identify, assess, purchase, and manage priority conservation lands and water sources along the Santa Cruz River.	Years 1 & 2
➤ A water harvesting guidance manual for Santa Cruz County that can be utilized as a guidance document for developers and homeowners. Explore the development of a basin-wide water harvesting manual.	Years 2 & 3

Activity 2 – Inform Future Policy Initiatives at Local and State Levels

Outcome: Using the riparian assessment and restoration work as a scientific foundation, integrate land-use policy, local land-use decisions, water management, and ecological monitoring results for holistic watershed management.

Outputs:

➤ New conservation policy tools (i.e. Water Resource Element for Santa Cruz County Comprehensive Plan, guiding documents for water harvesting and native plantings, etc) are informed by ecological monitoring and restoration work.	Years 1, 2, 3
➤ A bibliography of Best Conservation Management Practices (i.e. floodplain protection, water use guidelines, etc) in Santa Cruz County, Pima County, and the City of Tucson. The bibliography will be used to identify and address obstacles in local jurisdictions to implementing new conservation land and water policies.	Year 1
➤ Increase floodplain protection in Santa Cruz County through new ordinances and/or development standards.	Years 1 & 2
➤ Increased options for native plant protection through the integration of the Santa Cruz River riparian vegetation map and the Conservation Greenprint in local rezoning and new development applications.	Years 1 & 2
➤ Water harvesting techniques are incentivized within existing building codes and development standards in local municipalities.	Years 1 & 2
➤ Innovative conservation options for Assured Water Supply rules and groundwater management in the Santa Cruz Active Management Area are introduced and considered in partnership with Arizona Department of Water Resources.	Years 1, 2, 3

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Component 4 – River Conservation Authority & State of the Santa Cruz River Report

Activity 1 – Conservation Steering Committee

Outcome: Ensure lasting integration of aquifer enhancement, habitat protection, conservation policy, and monitoring activities supported under this grant.

Outputs:

➤ Two “River Celebration” events will be held in Spring 2008 and 2009 to increase community involvement and engagement in river stewardship.	Years 1 & 2 2 nd Q (March)
➤ The concept of a Conservation Steering Committee (CSC) will be developed in collaboration with the Science Advisory Committee, partner NGO’s and stakeholders, and local agencies.	Years 1 & 2
➤ A River Celebration in Year 3 will be held that culminates in a State of the Santa Cruz River Summit that will launch the Conservation Steering Committee.	Year 3, 4 th Q
➤ A Memorandum of Understanding (MOU) for the CSC for coordination on basin-wide restoration, monitoring, and policy activities and goals.	Year 3, 3 rd – 4 th Q

Activity 2 – State of the Santa Cruz River Watershed Report

Outcome: A report that presents the threats and opportunities for conservation along the Upper Santa Cruz River; promotes the conservation actions implemented during this project; describes the watershed-wide monitoring program; and highlights successful conservation efforts carried out during the course of this project.

Outputs:

➤ A Santa Cruz River website will serve as a platform for disseminating information on restoration, policy, and monitoring activities and as a foundation for sharing data that will inform the State of the River Report.	Year 1, 1 st - 3 rd Q
➤ A bibliography of successful examples of “State of” reports that will inform the development of the State of the Santa Cruz River report.	Years 1, 2 nd Q – Year 2, 1 st Q
➤ A State of the Santa Cruz River Watershed report that will establish an integrated approach to holistic watershed management that links land and water policy with on-going ecological monitoring.	Year 3 1 st - 4 th Q

Component 5 – Reporting to EPA

Activity 1 – Quarterly and Annual Reporting to EPA

Outcome: Ensure that the project progresses as scheduled and is reported on a quarterly to EPA.

Outputs:

➤ Quarterly and annual updates to the EPA using the project tracking form.	Years 1 - 3
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